CLAIMS:

What is claimed is:

1. A method comprising:

    receiving content from a host device for transmission via two or more tones in a

    multicarrier communication channel from two or more antenna(e); and

    multiplexing elements of the received content among at least a subset of the two or more

    antenna(e); and

    interleaving the multiplexed elements across multiple tones of the multicarrier wireless

    communication channel on at least a subset of the two or more antenna(e) to generate a signal for

    transmission from the antenna(e).

2. A method according to claim 1, wherein the received content is coded bits.

3. A method according to claim 2, wherein the bits are coded using any of a number of

    codes including one or more of a convolutional code, an LDPC code, a trellis code, a turbo code,

    a Reed Solomon code, and a BCH code, or punctured representations thereof.

4. A method according to claim 2, the interleaving element comprising:

    tone interleaving, wherein adjacent or nearly adjacent coded bits on each of the antennae

    are mapped to nonadjacent subcarriers.

5. A method according to claim 4, wherein the interleaver depth determines how many

    tones separate adjacent coded bits.

6.   A method according to claim 5, wherein the separation between adjacent coded bits is a function of a coherence bandwidth of the channel.

7.   A method according to claim 5, wherein the separation between adjacent coded bits is proportional to a length of channel impulse response in time.

8.   A method according to claim 5, the element of tone separation comprising:

        adaptively determining interleaver depth based, at least in part, on an observation of a length of a channel impulse response in time.

9.   A method according to claim 5, wherein the adjacent bits are separated by four (4) tones.

10.   A method according to claim 4, the interleaving element further comprising:

        quadrature amplitude modulation (QAM) interleaving, wherein adjacent coded bits are mapped alternately onto less and more significant bits of a QAM constellation to reduce long runs of low reliability bits.

11.   A method according to claim 10, further comprising:

        mapping the interleaved coded bits to QAM symbols.

12.   A method according to claim 11, the mapping element comprising:

2   mapping a number of bits to QAM symbols, wherein the number of bits is based, at least

3   in part, on a type of modulation employed by a transmitter of the generated signal.

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1   13.   A method according to claim 12, wherein the number of bits is one of a group consisting

2   of 1, 2, 4 or 6 bits, which are converted into complex numbers representing QAM constellation

3   points.

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1   14.   A method according to claim 13, wherein the conversion to complex numbers is

2   performed according to Gray coded constellation mappings.

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1   15.   A method according to claim 11, further comprising:

2   performing a cyclic shift of the QAM symbols on each antenna with respect to the other

3   antennae.

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1   16.   A method according to claim 15, wherein the cyclic tone shift from antenna to antenna

2   may be greater than 1.

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1   17.   A method according to claim 15, wherein the cyclic tone shift from antenna to antenna is

2   adaptive with spatial correlation, wherein the more correlated the fading on different antennas,

3   the greater the tone shift from antenna to antenna.

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1   18.   A method according to claim 15, the performing element comprising:

2   detecting that adjacent or almost adjacent coded bits are mapped to a common tone on

3   different antennas; and

4   introducing a greater cyclic shift between the coded bits.

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1   19.   A method according to claim 15, the performing element comprising:

2   detecting that the number of transmit antennas (Mt) is greater than 1, and expanding the

3   coded sequence to provide an Mt longer code sequence prior to interleaving and performing the

4   cyclic shift.

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1   20.   A method according to claim 2, the interleaving element comprising:

2   quadrature amplitude modulation (QAM) interleaving, wherein adjacent coded bits are

3   mapped alternately onto less and more significant bits of a QAM constellation to reduce long

4   runs of low reliability bits.

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1   21.   A method according to claim 20, the interleaving element further comprising:

2   tone interleaving, wherein adjacent coded bits on each of the antennae are mapped to

3   nonadjacent subcarriers.

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1   22.   A method according to claim 2, further comprising:

1   mapping the interleaved coded bits to QAM symbols.

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1   23.   A storage medium comprising content which, when executed, causes an accessing device

2   to implement a method according to claim 1.

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1 24.   An apparatus comprising:

2   a diversity agent, coupled with a transmitter, to receive content from a host device and

3 multiplex elements of the received content among at least a subset of two or more antenna(e),

4 and to interleave the multiplexed elements across multiple tones of a multicarrier wireless

5 communication channel to generate a signal for transmission from the two or more antenna(e).

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1 25.   An apparatus according to claim 24, further comprising:

2   a transmitter, coupled to the diversity agent, to convert the multiplexed and interleaved

3 content from the diversity agent and convert it in to a time domain representation before

4 selectively directing the time domain content to the two or more antenna(e) for transmission to a

5 remote device.

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1 26.   An apparatus according to claim 24, the diversity agent comprising:

2   a tone interleaver, to map adjacent or nearly adjacent coded bits of the received content to

3 nonadjacent subcarriers of the multicarrier wireless communication channel.

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1 27.   An apparatus according to claim 26, wherein the separation between adjacent coded bits

2 is a function of a coherence bandwidth of the channel.

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1 28.   An apparatus according to claim 26, wherein the separation between adjacent coded bits

2 is proportional to a length of channel impulse response in time.

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1 29. An apparatus according to claim 26, wherein the tone interleaver adaptively determines

2 interleaver depth based, at least in part, on an observation of a length of a channel impulse

3 response in time.

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1 30. An apparatus according to claim 26, the diversity agent further comprising:

2 a quadrature amplitude modulation (QAM) interleaver, responsive to the tone interleaver,

3 to alternately map adjacent coded bits onto less and more significant bits of a quadrature

4 amplitude modulation (QAM) constellation to reduce long runs of low reliability bits.

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1 31. An apparatus according to claim 30, the diversity agent further comprising:

2 a QAM mapper, responsive to the QAM interleaver, to map the interleaved content to

3 QAM symbols.

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1 32. An apparatus according to claim 31, wherein the QAM mapper coverts a group of bits to

2 complex numbers representing QAM constellation points.

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1 33. An apparatus according to claim 32, wherein the group of bits consists of 1, 2, 4, or 6 bits

2 based, at least in part, on the type of modulation employed by the apparatus.

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1 34. An apparatus according to claim 24, the diversity agent comprising:

2 a quadrature amplitude modulation (QAM) interleaver, responsive to a tone interleaver,

3 to alternately map adjacent coded bits onto less and more significant bits of a quadrature

4 amplitude modulation (QAM) constellation to reduce long runs of low reliability bits.

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35.   An apparatus according to claim 24, the diversity agent comprising:

a QAM mapper, responsive to a QAM interleaver, to map the interleaved content to

QAM symbols.

36.   An apparatus according to claim 35, further comprising:

a cyclic prefix element, to dynamically introduce a cyclic shift into the QAM symbols

from one antenna to another.

37.   An apparatus according to claim 36, wherein the cyclic tone shift from antenna to

antenna may be greater than 1.

38.   An apparatus according to claim 36, wherein the cyclic tone shift from antenna to

antenna is adaptive with spatial correlation, wherein the more correlated the fading on different

antennas, the greater the tone shift from antenna to antenna.

39.   An apparatus according to claim 36, wherein the cyclic prefix element determines

whether adjacent or almost adjacent coded bits are mapped to a common tone on different

antennas, and selectively introduces a greater cyclic shift between the coded bits based.

40.   A system comprising:

two or more dipole antenna(e), through which a multicarrier wireless communication

channel may be established with a remote device; and

4   a diversity agent, coupled with a transmitter, to receive content from a host device and

5   multiplex elements of the received content among at least a subset of two or more antenna(e),

6   and to interleave the multiplexed elements across multiple tones of a multicarrier wireless

7   communication channel to generate a signal for transmission from the two or more antenna(e).

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1   41.   A system according to claim 40, further comprising:

2   a transmitter, coupled to the diversity agent, to convert the multiplexed and interleaved

3   content from the diversity agent and convert it in to a time domain representation before

4   selectively directing the time domain content to the two or more antenna(e) for transmission to a

5   remote device.

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1   42.   A system according to claim 41, the diversity agent comprising:

2   a tone interleaver, to map adjacent or nearly adjacent coded bits of the received content to

3   nonadjacent subcarriers of the multicarrier wireless communication channel.

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1   43.   A system according to claim 42, wherein the separation between adjacent coded bits is a

2   function of a coherence bandwidth of the channel.

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1   44.   A system according to claim 42, wherein the separation between adjacent coded bits is

2   proportional to a length of channel impulse response in time.

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1   45.   A system according to claim 42, wherein the tone interleaver adaptively determines

2   interleaver depth based, at least in part, on an observation of a length of a channel impulse

3   response in time.

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1   46.   A system according to claim 42, the diversity agent further comprising:

2   a quadrature amplitude modulation (QAM) interleaver, responsive to the tone interleaver,

3   to alternately map adjacent coded bits onto less and more significant bits of a quadrature

4   amplitude modulation (QAM) constellation to reduce long runs of low reliability bits.

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1   47.   A system according to claim 46, the diversity agent further comprising:

2   a QAM mapper, responsive to the QAM interleaver, to map the interleaved content to

3   QAM symbols.

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1   48.   A system according to claim 47, wherein the QAM mapper coverts a group of bits to

2   complex numbers representing QAM constellation points.

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1   49.   A system according to claim 48, wherein the group of bits consists of 1, 2, 4, or 6 bits

2   based, at least in part, on the type of modulation employed by the apparatus.

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1   50.   A system according to claim 43, the diversity agent comprising:

2   a quadrature amplitude modulation (QAM) interleaver, responsive to a tone interleaver,

3   to alternately map adjacent coded bits onto less and more significant bits of a quadrature

4   amplitude modulation (QAM) constellation to reduce long runs of low reliability bits.

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1   51.   A system according to claim 43, the diversity agent comprising:

2   a QAM mapper, responsive to a QAM interleaver, to map the interleaved content to

3   QAM symbols.